

TABLE OF CONTENTS

	<u>page</u>
I. INTRODUCTION	1
II. ECONOMIC PRINCIPLES UNDERLYING ELIGIBILITY FOR PCS SPECTRUM	3
A. <u>Allocative and Technical Efficiency Loss</u>	3
B. <u>Possible Anticompetitive Effects of Open Eligibility</u>	5
1. Effects of Anticompetitive Pricing	5
2. Inhibited Entry and Innovation	7
C. <u>PCS Licenses Should be Freely Traded</u>	8
III. CURRENT CELLULAR PROVIDERS SHOULD BE ELIGIBLE FOR PCS LICENSES IN THEIR SERVING TERRITORY	8
A. <u>The Consequences of Increased Concentration in the Wideband PCS Market Would be Negligible</u>	9
1. Competition in the Cellular Markets	10
2. Measuring the Consequences of Open Eligibility	14
a. The Possible Anticompetitive Consequences of Open Eligibility are Small	14
b. Two Cases	17
3. Summary	18
B. <u>The Efficiency Gains from Integrating Cellular and Wideband PCS Services Could be Substantial</u>	19
C. <u>Eligibility Should be Unrestricted for Other PCS Licenses</u>	21
IV. LECS SHOULD BE ELIGIBLE FOR PCS SPECTRUM IN THEIR SERVING TERRITORY	23
A. <u>Vertical Anticompetitive Effects are Unlikely</u>	24
1. Incentives	24
2. History	26
3. Discrimination, Cross-Subsidization, and Non-Structural Safeguards	27
B. <u>Horizontal Anticompetitive Effects are Unlikely</u>	29
C. <u>Gains from Integration are Significant</u>	31
V. AUCTIONS ARE THE MOST EFFICIENT METHOD OF ASSIGNING SPECTRUM	33

I. INTRODUCTION

In its Notice of Proposed Rulemaking, the Commission seeks to establish the ground rules for the provision of personal communications services (PCS). The Notice articulates four values to be balanced (*viz.*, universality, speed of deployment, diversity of services, and competitive delivery) and leaves unstated the overriding goal of using the scarce resource of the radio spectrum to provide the greatest benefit to a wide range of users.

The Notice emphasizes diversity of services, in particular, as a goal and discusses three different types of PCS that might be produced: (1) wideband PCS allocated in up to 5 blocks of about 20 MHz, (2) one 10 MHz channel for use as an adjunct to a local wireline system, and (3) 3 MHz in the 900 band for narrowband PCS applications. By its allocation proposal, the Commission hopes to establish markets in which the full range of PCS will actually be supplied. Critical to the achievement of that goal are two regulatory decisions: what firms shall be eligible to hold a PCS license, and by what method shall those firms be selected?¹ Based on the Commission's previous experience in the paging and cellular markets, these are the decisions that will determine whether, when, which, and how PCS services will be supplied to the U.S. market.

Our report examines these questions and presents two basic findings.

1. Eligibility to acquire and operate a PCS license should not be subjected to artificial restrictions or preferences. The costs of such restrictions outweigh the possible benefits.
2. Auctions provide the best possible means of awarding PCS licenses. In the absence of auction authority, a simple lottery followed by a competitive auction for licenses among eligible operators would achieve the Commission's goals at lowest cost.

¹By eligibility, we mean the right to acquire (through lottery or purchase) and operate a PCS license. The Notice particularly requests information concerning eligibility for PCS licenses of holders of current cellular licenses or providers of local exchange telephone service in the same territory.

In reaching these conclusions, our analysis takes two features of the PCS decision as given. First, of the 220 MHz of 2 GHz spectrum allocated in the recent emerging technologies decision,² only 140 MHz is allocated for PCS services in the Notice.³ Holding constant the amount of spectrum in a license, allocation of additional spectrum to PCS would increase the number of competitors in each market. Licensing restrictions that are said to be required to increase the number of competitors in the market must actually be weighed against the alternative of allocating more spectrum to the market.

Holding constant the amount of spectrum allocated in the Notice, it is necessary to weigh the possible benefits from more competitors against the possible losses in efficiency from excluding certain potential entrants. Our analysis indicates that several gains in efficiency would likely occur if new PCS applications are integrated with existing cellular and/or wireline operations. There appear to be economies of scope, which would result in both lower costs and prices from integrating PCS and cellular networks as well as PCS and wireline operations. For example, allowing integration of PCS and wireline operations would be procompetitive in that it would offer consumers competitive alternatives in addition to the offerings from the integrated non-LEC network/PCS systems currently being tested. Integrated systems will likely produce innovative products as well, e.g., cordless payphones, where substitution for LEC payphone services is economic.

Moreover, an inescapable fact in this industry is that the nature of the services that will ultimately be provided using this spectrum is--and should be--uncertain. As a consequence, spectrum allocation and its associated regulations must permit spectrum to flow to its most desired use as

²Decision, in ET Docket No. 92-9, announced September 17, 1992.

³The Notice effectively allocates the 1850-1990 MHz band to PCS, leaving 80 MHz unallocated from the 2110-2150 and 2160-2200 MHz bands assigned to emerging technologies in the Commission's September 17 Order. The recent World Administrative Radio Conference in Spain assigned spectrum in these bands to future public land mobile systems on a worldwide basis and to mobile satellite services in Region 2.

determined by consumers. An important component of a spectrum allocation plan is the ability to transfer licenses freely through reasonably competitive and well-developed markets. A further consequence of the uncertainty surrounding the nature of the services that will ultimately emerge is that discriminatory treatment of firms based on the services they currently provide makes no sense. The goals of universality, speed of deployment, diversity of services, competitive delivery, and deriving the maximum value from the spectrum will be best met by letting market forces decide the types of PCS services that should be provided, the prices and quality levels at which those services should be provided, and the firms best suited to supply those services.

II. ECONOMIC PRINCIPLES UNDERLYING ELIGIBILITY FOR PCS SPECTRUM

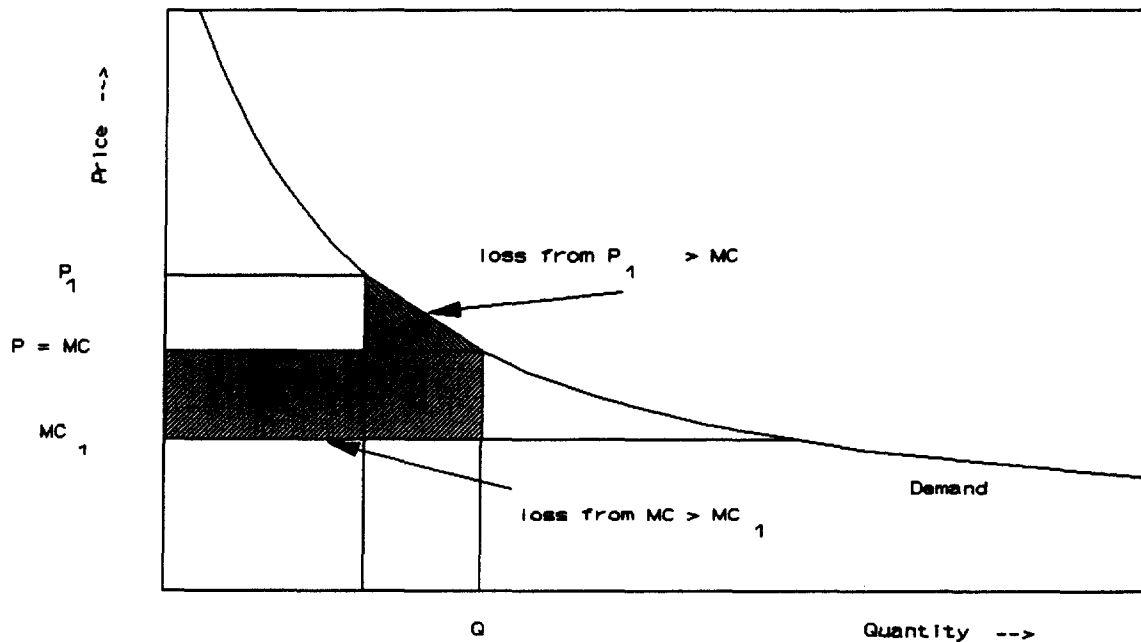
All else equal, exclusion of firms from participation in a new market entails potential losses in economic efficiency. Excluding a firm from the pool of applicants or bidders risks eliminating a competitor that might bring unique advantages to the PCS market, serving its market niche more efficiently than other providers. Indeed, the heart of the eligibility question is the tradeoff between possible efficiency gains from integrating new and incumbent firms and possible efficiency losses from anticompetitive activity.

A. Allocative and Technical Efficiency Loss

We will explore the costs and benefits of permitting incumbent cellular providers and local exchange carriers to acquire a PCS license in their service territories below. In theory, the efficiency losses from excluding an efficient competitor and inhibiting the competitiveness of the market are of two different types and magnitudes. The result of inadequate competition would be prices that were higher than necessary. High prices, in turn, result in consumers purchasing less of

the service; at the margin, units of service would not be purchased despite the fact that the customer valued the service more than the cost of providing it. The cost of this type of inefficiency, called allocative inefficiency, would impose costs only at the margin, i.e., on the demand that would be repressed by the inefficiently high price. If consumers did not change their demand at all in response to price changes, there would be no loss in allocative efficiency from inefficient pricing. In contrast, the efficiency loss from excluding a low cost firm (technical inefficiency) is inframarginal: i.e., efficiency would be lost on every unit produced, not just on those units which would be repressed by service prices set above their efficient level. As shown in Figure 1, technical and allocative

Figure 1
Welfare Losses from Inefficient Entry



efficiency losses are frequently referred to as first and second-order efficiency losses respectively because of the relative magnitude of the efficiency loss from excluding a low cost producer compared with the loss from pricing above marginal cost.

If marginal cost is given by MC and the service price is set at P_1 , the loss in welfare (consumer plus producer surplus) because P_1 is greater than MC is given by the triangle C . If the minimum marginal cost were MC_1 and the service price remained at P_1 , the loss in welfare from production using the high-cost technology having marginal cost MC would be the rectangle A . As the demand curve becomes more inelastic, the area of triangle C becomes smaller. The area of rectangle A does not depend on the price elasticity of demand. In this sense, allocative inefficiency only applies to marginal units of service while technical inefficiency applies to all units of service demanded.

In principle, then, increasing the number of firms that are eligible to acquire PCS licenses reduces the likelihood that an efficient provider will be excluded from the market. Permitting existing firms to participate also fosters service diversity, makes possible a more rapid development of the market, and potentially lowers costs through economies of scope with existing services. In addition, not basing exclusion restrictions on the current provision of services or ownership of licenses keeps an arbitrary and potentially awkward distinction out of the regulatory framework the Commission would have to administer.⁴

B. Possible Anticompetitive Effects of Open Eligibility

1. Effects of Anticompetitive Pricing

Paragraphs 63-65 of the Notice point out that the benefits to consumers of

"lowering prices, improving service and increasing the availability of innovative products...may be reduced if cellular incumbents are permitted to acquire PCS licenses within their service areas. Incumbent cellular operators might limit entry for some period of time by acquiring licenses

⁴Since the service territories of local exchange carriers and cellular carriers are not identical--and since neither territory coincides with the LATA boundaries--exclusion of local phone companies or cellular providers from PCS licenses in their service territories is not free from ambiguity.

from potential competitors...This would reduce the number of independent competitors in the market and raise antitrust concerns. Concerns about competition would not be raised, however, if cellular service providers were to acquire PCS licenses outside their current service areas."

The passage recognizes that possible anticompetitive effects of cellular participation in the PCS market must be judged in properly defined economic markets. In the Notice it is recognized that open eligibility may affect prices, service quality, and speed of innovation in the market that includes PCS. We first focus our discussion on the likely impact of open eligibility on price in the market. We then focus on the likelihood that innovation and entry would be deterred by open eligibility. We conclude that open eligibility would promote the Commission's objectives.

Open eligibility may affect current conventional cellular carriers and LECs differently. Standard tools of economic analysis examine (i) the ability of firms in a market to raise their price above the competitive level, and (ii) the change in that ability brought about by the acquisition. Using these tools below,⁵ we show that prices in PCS markets would not increase significantly (and welfare would not decrease significantly) if an incumbent cellular provider acquired a PCS license in its serving territory.

If a local exchange carrier were to acquire a PCS license, the competitive concerns raised by the Notice would be different:

"if LECs are permitted to supply PCS within their service territories, they may have incentives to discriminate against competitors requesting interconnection as well as to cross-subsidize PCS provision from expenditures ostensibly made to serve rate-regulated wireline customers."
[Notice, ¶ 72]

Here, the relevant economic principles concern the local exchange carriers' incentives for (i) cross-subsidizing a competitive service from regulated services, and (ii) raising the costs of competitors

⁵See Table 1.

by improperly pricing interconnection services. We derive below a simple pricing rule based on observable data that prevents both the cross-subsidization of PCS services and the improper pricing of interconnection services. From an economic perspective, the two problems are identical and a single, sensible pricing rule prevents both of them. Thus, open eligibility for LECs would not create cross-subsidy problems.

2. Inhibited Entry and Innovation

The Notice implies that open eligibility may inhibit entry and innovation in the market that includes PCS. The Notice points out that incumbent cellular operators might limit or forestall entry or retard innovation. First, while it seems apparent that incumbent cellular firms could limit entry by acquiring licenses from potential competitors, there is no economic justification for this behavior without the possession of market power in the cellular market. We show below that there is no evidence of such market power. Thus because such behavior would not be profitable, incumbent cellular firms would not waste resources limiting entry.

Second, unless incumbent firms have market power and could control all PCS licenses, the remaining competitors would have sufficient capacity to limit the incumbents' ability to maintain a supra-competitive price. Third, even if the incumbent firms possessed market power, they still would have an economic incentive to adopt a new technology rapidly, if the new technology posed a competitive threat to their services. In the case of PCS, new entrants will market the new technology irrespective of the decisions of the (hypothetical) integrated cellular-PCS firm. Thus the integrated firm will have to adopt the new technology in order to compete.

C. PCS Licenses Should be Freely Traded

A final economic principle underlying our analysis of the costs and benefits of open eligibility for PCS licenses is that consumers are best served when scarce resources (such as radio spectrum) are free to seek their most valued use in competitive markets. Thus, consumer welfare is enhanced when licenses can be used to provide whatever services the market ultimately demands and when licenses can be readily bought and sold by financially and technically competent firms. The presence of working markets for licenses also relieves some of the strain placed on the procedure for assigning PCS licenses; if licenses can be bought and sold, firms or services that value the spectrum more would presumably be able to purchase it. A reasonable model for transfer rules are the current rules governing acquisition and sale of cellular licenses. As we discuss below, cellular licenses are bought and sold freely,⁶ and cellular properties have been rationalized and integrated as determined by the license holders. Even distinctions made at the initial distribution of licenses were not held to apply to the aftermarket; in particular, the distinction between wireline and nonwireline carriers has been treated as irrelevant once the initial distribution of licenses takes place.

III. CURRENT CELLULAR PROVIDERS SHOULD BE ELIGIBLE FOR PCS LICENSES IN THEIR SERVING TERRITORY

From an economist's perspective, allowing the acquisition of a PCS license by a firm that already possesses a cellular license for the same territory is similar to allowing the incumbent to merge with the hypothetical PCS entrant that would otherwise have used the license. In turn, that analysis weighs the potential adverse consequences from having one less supplier of PCS and cellular

⁶Subject to limitations on foreign ownership and the condition that one entity not own both frequencies in the same market.

services against the potential benefits from the integration of the two firms. We note at the outset that if there turn out to be negligible anticompetitive effects from such a merger, then open eligibility will necessarily be the best policy. Even if the cost savings from integration were negative (indicating diseconomies of scope), open eligibility would still make sense. A properly functioning aftermarket for spectrum would assure that the PCS license would ultimately be held by the firm which valued the license the most.⁷ If there were diseconomies of scope, cellular firms would not voluntarily acquire PCS licenses.

Thus, the only adverse consequence of open eligibility is the effect of increased concentration, which we discuss below. In particular, the possible inequity of granting additional spectrum to current license holders does not occur under a policy of open eligibility. Open eligibility does not mean that incumbent cellular providers will be given additional spectrum for PCS. Rather, open eligibility requires only that incumbents not be barred from acquiring additional spectrum at market prices.

A. The Consequences of Increased Concentration in the Wideband PCS Market Would be Negligible

A goal of the Notice (§ 26) is to "introduce additional competition to current mobile radio services," partly in response to the stated concern that the current cellular market structure may provide only limited competition (§ 65). The Notice also expresses concern that permitting a cellular supplier to acquire a 2 GHz PCS license might reduce potential benefits from competition and raise antitrust concerns (§ 64). To assess these concerns, we examine the current degree of competition in existing cellular markets and measure the effects of a policy of open eligibility for PCS licenses.

⁷As long as the market for mobile telecommunications is effectively competitive, this assignment of licenses to firms will be efficient.

Competition appears to be thriving in cellular markets today, and the potential benefits from additional competition in the form of an additional wideband PCS supplier appear to be small.

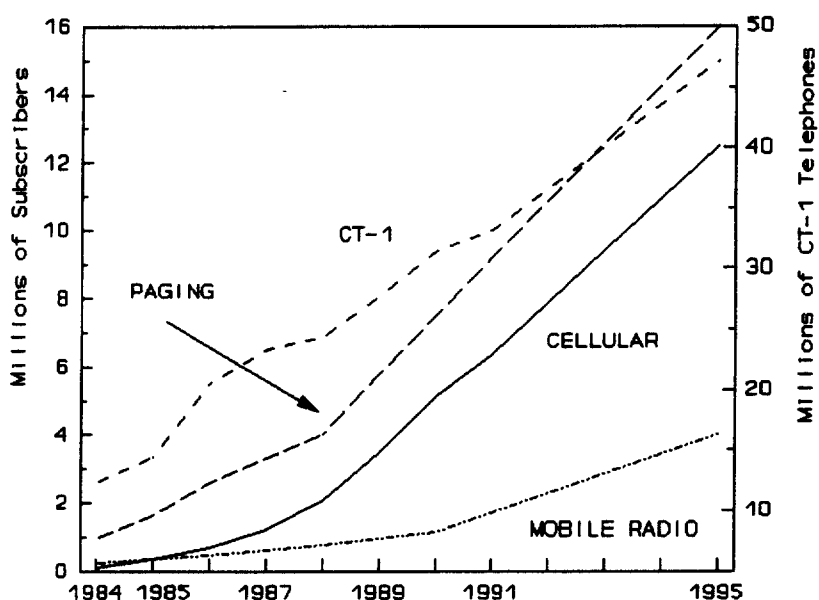
1. Competition in the Cellular Markets

Cellular telephony is organized as a (largely) unregulated duopoly in the United States with entry limited by the availability of only two 25 MHz channels in each geographic market. At its inception, one channel was allocated to wireline carriers and the other to non-wireline providers, though no such restriction is imposed on licenses once they are awarded. The Commission has generally followed procompetitive policies in these markets, including (i) preventing a licensee from holding a significant share of both spectrum blocks in the same area, (2) proposing to delay entry of the wireline carrier if the resulting head start were demonstrably anticompetitive, and (3) preempting state regulation of entry that would harm competition.⁸ As a result of the Commission's policies, augmented by rapid growth in demand and change in technology, the behavior of the cellular markets appears to be reasonably competitive.

First, cellular markets have grown rapidly and market shares have fluctuated significantly since 1984. Figure 2 shows subscribership for mobile services; in recent years, annual growth rates for cellular service have averaged between 30 and 50 percent. Despite the 12 to 18 month head start for wireline carriers, non-wireline suppliers have attained nearly equal market share in total and have exceeded the market share of the wireline carrier in some markets. Penetration rates for wireline carriers average 1.54 percent compared with penetration rates of 1.26 percent for non-wireline

⁸Report of the Bell Companies on Competition in Wireless Telecommunications Services, 1991, (Report) October 31, 1991, p. 7.

Figure 2
Mobile Telecommunications
Number of Subscribers
1984-1995



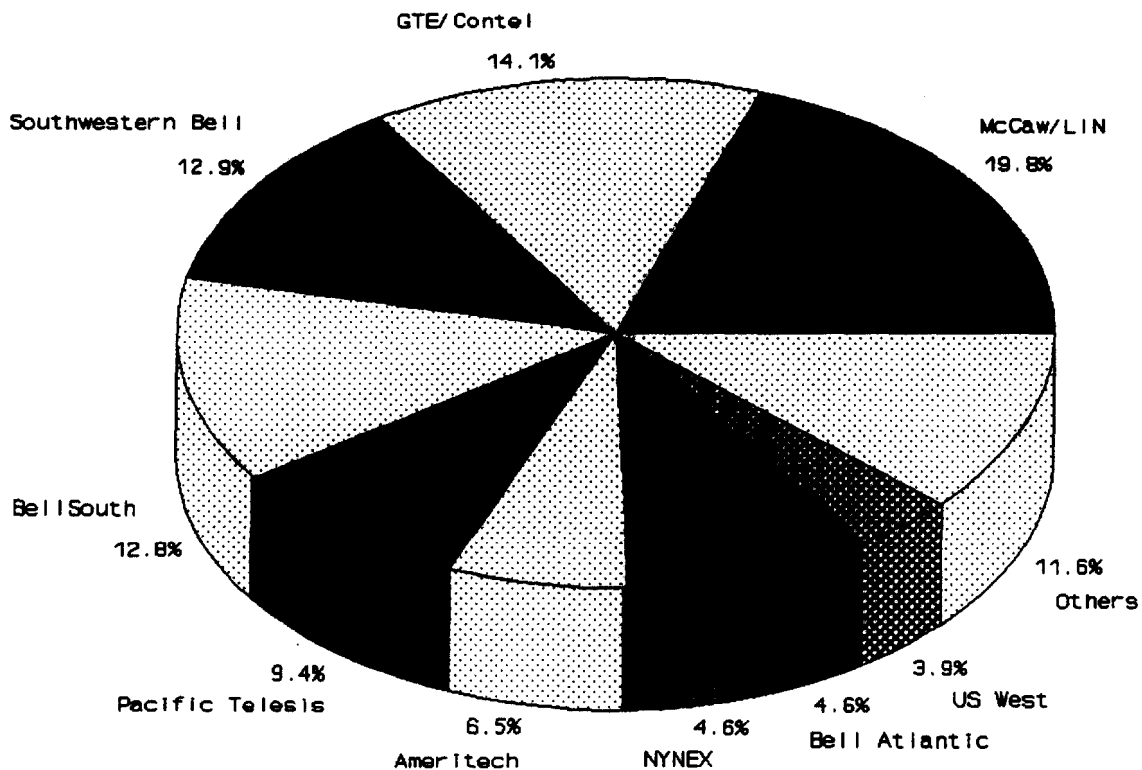
carriers.⁹ Non-wireline suppliers serve over 40 percent of U.S. cellular subscribers. Non-RBOC companies serve over 45 percent.¹⁰ The biggest cellular company in the U.S. is currently McCaw, measured in terms of subscribers, markets, pops, or revenues. Runner-up is GTE/Contel and market shares measured by subscribers are shown in Figure 3.

⁹Weighted averages calculated from penetration estimates in Cellular Investor, December 20, 1990, p. 4.

¹⁰Calculated from Report, Table 1.5, p. 26.

Second, estimates of the market price elasticity of demand for cellular service reveal that demand is quite inelastic, probably in the -0.3 - -0.4 range.¹¹ This fact, by itself, indicates the presence of significant price competition among the cellular duopolists, because a monopolist (or a pair of duopolists acting in concert) could not be maximizing profits unless price were sufficiently high that the market demand was elastic (having a price elasticity below -1.0).

Figure 3
Shares of Subscribers in the 1991 Cellular Markets



¹¹A point estimate of -0.39 is shown in J.A. Hausman and T.J. Tardiff, "Growth in New Product Demand Taking into Account the Effects of Price and Competing Products: Mobile Telecommunications," presented at the Second Annual Symposium, "Future Competition in the Telecommunications Industries," Cambridge, Massachusetts, November 8, 1990. Estimates in the -0.3 - -0.4 range are cited in Professor Hausman's affidavit (¶ 25) in the recent petition for removal of the MFJ restrictions on interLATA radio-based service.

Third, consumer prices appear to be falling in the cellular markets. Due largely to technical change, the price of cellular telephones has fallen dramatically. From 1984 to 1990, the purchase price of a cellular phone fell from about \$1,900 to about \$300 (measured in 1990 dollars).¹² According to a study by the Eastern Research Corporation, real (inflation-adjusted) prices for equipment and service fell at about an 8 percent annual rate from 1983 to 1991, and the U.S. Department of Commerce estimated that cellular service prices fell by 6 percent in 1990.¹³ Taking discounts on equipment into account, Hausman calculates that the real price of cellular usage declined by 10 to 12 percent annually over the past five years.¹⁴

Fourth, the FCC has recently authorized Fleet Call's application to use specialized mobile radio spectrum for the operation of Enhanced Specialized Mobile Radio (ESMR) service in six large metropolitan areas.¹⁵ ESMR uses spectrum previously allocated to dispatch services. It is a low-power, multiple base station, TDMA (time-division multiple access) digital technology designed for very large service areas. Thus from the customer's perspective, ESMR is a close substitute for conventional analog cellular service. Its availability will thus reduce concentration in existing cellular markets.

Finally, the revealed preferences of federal and state regulators suggests that competition is currently adequate to prevent the creation of market power by any cellular carrier. Prices and profits of cellular carriers are not subject to federal regulation, and they are not controlled by state regulation in roughly half the states. In the remaining states, price regulation generally takes the

¹²J.H. Rohlfs, C.L. Jackson, and T.E. Kelly, "Estimate of the Loss to the United States Caused by the FCC's Delay in Licensing Cellular Communications," NERA Report, November 8, 1991.

¹³Studies cited in the Report, p. 22.

¹⁴Hausman Affidavit, ¶ 24.

¹⁵*In re Fleet Call, Inc.*, 68 Rad. Reg. 2d (P & F) 1301, March 14, 1991.

form of requiring that tariffs be filed and that advance notice be given for price changes. It appears that no state other than California applies profit regulation (such as traditional rate of return or price cap regulation) to cellular or paging companies. Moreover, states that do regulate cellular prices experience average cellular prices that are significantly higher than in states where prices are unregulated.¹⁶ Despite the duopoly structure of the cellular markets, competition appears to be succeeding better than regulation in controlling retail cellular prices.

2. Measuring the Consequences of Open Eligibility

In this section, we analyze whether open eligibility will increase the market price for mobile services if incumbent cellular providers acquire a PCS license. Our analysis shows that under very conservative assumptions, such potential price increases are very small. We also examine two cases: acquisition of a PCS license by an incumbent cellular provider in another region and mobile radio markets in regions with low populations.

a. The Possible Anticompetitive Consequences of Open Eligibility are Small

The anticompetitive consequence in question is a possible increase in the market price of mobile services brought about by lessened competition stemming from the acquisition of a PCS license by an incumbent cellular provider. The idea is that competition among a smaller number of participants will raise the likelihood of anticompetitive actions and result in higher market prices. In this section, we apply a simple Cournot oligopoly model that embodies this relationship between the number of firms and price to the stylized facts of the mobile telecommunications market.

At the outset, we note that the Cournot model will likely lead to conservative conclusions. If firms compete by setting prices, then a single competitor will provide sufficient

¹⁶See Hausman, Affidavit, p. 10.

competition to ensure a market price at the competitive level. When firms provide identical products and compete by setting prices, infinitesimal changes in a firm's price will lead to enormous changes in the firm's demand, implying a large price elasticity of demand for that firm. In contrast, Cournot competition assumes firms compete by setting output levels. A result of this assumption is that the implied price elasticities of demand for firms are much lower. The firm's demand elasticity under Cournot competition is equal to the market demand elasticity divided by the firm's market share. As we remarked earlier, the firm's demand elasticity must be less than minus one.¹⁷ Using the estimate of the market demand elasticity of -0.4, demand must be necessarily inelastic for at least one of the incumbent cellular providers. This result is inconsistent with the Cournot hypothesis and profit maximization, demonstrating that firms are more competitive than the Cournot model would suggest. While the Cournot assumptions seem restrictive, the Cournot outcome has been recognized in the literature as equivalent to a more realistic model where firms first decide their capacity and then, in a second stage, compete by setting price given that fixed capacity.¹⁸

We assume the market contains a fixed number of identical firms. Marginal production costs are constant (and the same for each firm) and the market demand curve is linear. Each firm chooses its level of output, and the market price adjusts to clear the market given the output decisions of all firms. The most profitable output level for a given firm depends on the output levels and reactions of all other firms. The Cournot model assumes that each firm treats its competitors' output as fixed. For each firm, then, we can write a function relating its most profitable level of production to all other firms' outputs. This reaction function specifies the firm's most profitable response to the output decisions of other firms. All other firms perform the same calculation, and each firm

¹⁷See Section III.A.1.

¹⁸D. Kreps and J. Scheinkman, "Quantity Precommitment and Bertrand Competition Yield Cournot Outcomes," Bell Journal of Economics, 14, pp. 326-337.

obtains its own reaction function. An equilibrium in the market is a solution of this system of simultaneous equations, i.e., a set of outputs at which no firm has an incentive to alter its level of output.

For the cellular telecommunications market, the assumption of a fixed number of identical firms reflects the fixed allocation of spectrum to the market. We take incremental costs (for an additional subscriber) to be approximately \$700 per year, comprised of capital expenses of \$240, marketing expenses of \$285, and operating and maintenance expenses of \$175.¹⁹ The market price elasticity of demand is assumed to be -0.4, and we assume a linear demand curve. The eight firm (before consolidation) scenario is the likely outcome of allocating the 140 MHz in the Notice. It consists of 5 PCS, 2 cellular, and 1 ESMR license. The 14 firm scenario allocates the entire 220 MHz of emerging technologies spectrum to different firms in units of 20 MHz. The 4 firm scenario represents the current market, including 2 cellular carriers, 1 ESMR license, and a hypothetical additional cellular carrier. Table 1 shows the percentage change in market price from a reduction

Table 1
Consequences of Having One Fewer Competitor
in a Simple Cournot Model of the Cellular Market

Number of Firms in the Market	Change in Equilibrium Price	Change in Consumer Surplus	Change in Welfare
4	11.5%	-12.9%	-2.4%
8	4.22%	-3.15%	-0.33%
14	1.70%	-1.02%	-0.07%

¹⁹Capital expenses are taken from Rohlfs, Jackson, and Kelly, op. cit., p. 15. Advertising expenses are taken to be 25 percent of revenue, and operating and maintenance expenses are estimated to be approximately 15 percent of revenue.

of one in the number of firms in the market, the change in consumer surplus, and the change in welfare (consumer plus producer surplus) resulting from the price increase. The 4 firm scenario shows that there is significant gain in welfare from expanding the current market. However, with the number of firms likely to result from the additional spectrum (140 MHz or 220 MHz) specified in the Notice, the benefits from an additional firm are much smaller, as shown by the 8 and 14 firm scenarios.

Note that this calculation is conservative in that it assumes that PCS spectrum is freely fungible across services that compete in the same product market as cellular service. If small-cell, low-power PCS is a poor substitute for cellular service and differences in the network architecture of PCS and cellular service prevent cellular firms from providing PCS and vice-versa, then this calculation will overstate the effect on the cellular or PCS market price of a merger between a cellular and PCS provider in the same geographic area.

b. Two Cases

This method of analysis also identifies two particular circumstances in which the threat to competition from open eligibility is especially improbable. First, as observed in the Notice, holding a PCS and a cellular license in two different geographic areas can have no anticompetitive effects.²⁰ Mobile telephone services in different areas are in different markets, so ownership of multiple licenses--each in a different market--can have no effect on market concentration or the competitive process.

Second, the same amount of spectrum is available for mobile service in New York City as in Phippsburg, Maine. Even if the latter market could support two cellular carriers, an ESMR

²⁰See, e.g., Notice, ¶ 64. In its allocation of cellular licenses, the Commission has recognized that there should be no bar to the number of SMSAs for which an applicant may seek a license or to the geographic pattern of those licenses. (89 F.C.C. 2d at 87-89).

provider, and five or more PCS suppliers, firms in such a market would all experience excess capacity. In markets where, in equilibrium, spectrum is unassigned or firms have excess capacity, there would be relatively little harm to competition from the integration of a cellular and PCS provider. An attempt to exercise market power by the merged firm would immediately attract either (i) entrants who would face no significant entry barriers because of the assumed availability of spectrum or (ii) expansion from incumbents having spare capacity. This observation leads to two conclusions. First, if cellular carriers were prohibited--in general--from acquiring a PCS license in their territory, exceptions should be made for markets whose spectrum would be otherwise underutilized. In those cases, there is little likelihood of anticompetitive effects from joint provision of PCS and cellular services. Second, one of the stated goals in this proceeding is universality of service, and in rural areas where capacity exceeds demand, excluding incumbent cellular providers would limit services otherwise available to customers. Particularly in rural areas where economies of scope between PCS and cellular services are large, joint supply of PCS with an existing cellular service may be the only economical way to supply PCS services.

3. Summary

Competition is thriving in mobile telecommunications and in the cellular markets in particular. Cellular subscribership is growing at a 30-50 percent annual rate, prices are falling, wireline and independent suppliers are prospering at different rates in different markets, and technical change--in the form of digital and ESMR services--is expanding existing capacity even while the FCC is allocating emerging technologies spectrum to new services. In this setting, what are the possible harms to competition from permitting a cellular carrier to acquire a PCS license in its territory?

Conventional economic measures of the potential harm to competition give no cause for alarm. A simple analytic model shows the effect of the number of competitors on the market price

is small in an industry like mobile telecommunications, and the welfare consequences of that small price difference are also small. There could be no anticompetitive effects from acquiring multiple licenses in different territories or from integrating PCS and cellular service in markets with under-utilized spectrum. We conclude that significant competitive harm is unlikely to occur if incumbent cellular carriers are permitted to acquire PCS licenses in their territory.

B. The Efficiency Gains from Integrating Cellular and Wideband PCS Services Could be Substantial

The benefit from mergers in economic theory is their potential ability to increase efficiency which would, in turn, increase the competitiveness of firms and markets, reduce costs of production, make services viable where they would otherwise not be provided, and generate lower prices for consumers. In markets where mergers do not create, enhance, or facilitate the exercise of market power by the incumbents, these efficiency gains explain why companies voluntarily merge or why a cellular supplier might seek to acquire a PCS license in its territory.

The nature of the PCS service that will be provided in the 2 GHz band is unknown. That fact prevents our measurement of substitutability between PCS and cellular services, and it also prevents us from measuring directly the economies of scope between the services. However, some sources of cost savings are clear. Cellular firms have obvious transferable experience in the industry and have acquired valuable technical expertise in PCS through investment in research, development, and market trials. Additional cost savings would be achieved through the use of common marketing and distribution facilities including the participation of the existing network of nearly 500 cellular resellers.

The largest potential source of cost savings comes from sharing the network infrastructure which currently links cell transmitters and receivers and exploiting its economies of scope. Cellular networks today resemble landline networks: cell sites are connected²¹ to mobile telephone switching offices (MTSOs) which arrange for billing, link customers to long distance carriers or to the landline network, and hand-off subscribers as they move among cells and between systems.²² A low-powered PCS network would require many additional cell sites, but cost savings could be achieved by joint use of MTSOs and the microwave or landline links that connect them.

Two trends in the cellular industry indicate the potential cost savings from sharing infrastructure between PCS and cellular systems. First, a growing number of cellular suppliers find it cheaper to use another carrier's MTSO for switching services, exploiting economies of scale in switching. Presumably the same scale economies would indicate that joint use of an MTSO by a cellular and PCS provider--particularly in the same geographic area--would be cheaper than using two separate switches.

Second, cellular companies are currently exploiting scale economies through clustering: acquiring contiguous licenses that make use of common MTSOs and other infrastructure and that reduce the number of intersystem handoffs. A cursory examination of the geographic pattern of cellular acquisitions makes it clear that the trend is important.²³ It is generally perceived in the industry that "clustered systems can be much cheaper to operate," and that "by operating adjacent markets, a company is ...able to share switches, marketing, management and engineering teams and

²¹By microwave systems or by landlines provided by the local telephone or cable company.

²²An MTSO serves between 50,000 and 100,000 subscribers and is comparable in size to a local exchange carrier's Class 5 switch.

²³The change in system maps over time for the major cellular carriers is presented in the Report on pp. 41-62.

economies of purchase."²⁴ By itself, this clustering phenomenon in the cellular market today provides strong evidence that cost benefits from shared infrastructure between PCS and cellular providers will be substantial.

We emphasize that clustering does not necessarily imply that the initial distributions of cellular licenses or the sizes of the MSAs and RSAs are inefficient. Instead, economies of scale may be realized most efficiently by having small license areas and allowing the aftermarket to redistribute licenses geographically. It may be more efficient to use the resale market to build a cluster from licenses covering relatively small areas than to define cluster-sized areas for the initial distribution of licenses.

C. Eligibility Should be Unrestricted for Other PCS Licenses

The Commission proposes to allocate 3 MHz of spectrum in the paging bands (901-902, 930-931, 940-941 MHz) for licensed narrowband PCS applications. Three alternative channelizations are proposed. Applications contemplated for this spectrum include one-way low power systems, one-way high power systems, and two-way narrow bandwidth services. Examples of one-way services include facsimile, graphics and imaging services; two-way service examples include advanced paging services (offering tracking and acknowledgement) and advanced cordless telephone service.

From this service description it appears unlikely that the 900 MHz PCS services will compete directly with cellular or wideband PCS services. These services compete in distinct product markets, so that no anticompetitive concerns would arise if a single firm possessed both cellular and 900 MHz licenses for the same territory. The Commission evidently subscribes to this view of the

²⁴Report, pp. 124-126, which cites cellular carriers' annual reports, state public utility commission decisions, and the trade press in support of the cost advantages obtainable from clustering.

markets because it imposes no licensing restrictions to prevent cellular and paging firms from holding spectrum in the same territory.

A possible anticompetitive concern is raised in ¶ 66 of the Notice, where the Commission observes that if PCS and cellular providers have technical flexibility and cellular carriers have unused spectrum, they could enter the PCS market using their cellular spectrum. Hence, permitting a cellular provider to acquire a PCS license would reduce by one the number of participants in the PCS market. There are two problems with this argument. First, it may be difficult for a cellular provider to obtain customer equipment for use in the cellular bands at prices competitive with equipment supplied for the existing paging bands. Second, the amount of unused spectrum for cellular providers varies widely, but in major markets, it is small. Thus only narrowband PCS would be a candidate for such activity, and with the recent expansion of capacity in paging, there is little to be gained from having additional capacity for such services.²⁵

On the cost side, it is difficult to forecast economies of scope between narrowband PCS offerings and conventional or digital cellular service. The design of the networks that supply these services is very different, so one would not expect the cost savings from integrated production that we observed for wideband PCS and cellular services. However, there may be benefits from joint marketing of complementary uses for these services: e.g., paging combined with cellular service as a call-screening device. Irrespective of cost savings, however, because the products are not substitutes, there is no likelihood of competitive harm from the integration of a cellular and a narrowband PCS supplier.

²⁵Since 1981, paging channels have increased from 8 to 96 in each geographic area. In addition to this capacity increase, the FCC has relaxed restrictions on private paging systems and permitted FM radio stations to use their subcarrier frequencies for paging.

The Notice also proposes to devote 20 MHz of spectrum to unlicensed operation in the 1910-1930 MHz band (§ 40-45) with proposed channelizations of 10, 1.25 MHz and 100 kHz. Unlicensed services, by their nature, take place in competitive markets, at least insofar as the right to use spectrum confers no monopoly rents on any firm. Since no license is required of any party, it would be inconsistent to exclude existing cellular carriers from this market. Since the presence of the integrated firm would not prevent another firm from entering, there would be no anticompetitive effects from participation by existing cellular carriers.

IV. LECS SHOULD BE ELIGIBLE FOR PCS SPECTRUM IN THEIR SERVING TERRITORY

Control of a PCS license by the local exchange telephone company serving the area raises very different concerns from those of the previous section. There, we saw that permitting a cellular carrier to acquire a PCS license in its territory had the same economic effect as the horizontal merger of two firms. Here, permitting the LEC to acquire a PCS license raises competitive concerns of a vertical nature as well. To the extent that access to the public switched telephone network (PSTN) is a non-competitive LEC service that must be purchased by PCS providers, the LEC has the ability to disadvantage its competitors in the retail PCS market by supplying access to its competitors at high prices or low levels of quality. Since a significant portion the LEC's business is regulated, there is also concern that the LEC's regulated services not subsidize its competitive PCS offerings.

This vertical relationship within the LEC between a retail market (PCS) and a possibly non-competitive wholesale market (interconnection) is not uncommon. It characterizes current LEC participation in mobile communications industries (cellular and paging) and in competitive wireline

industries such as intraLATA toll, Centrex, pay telephone, and operator services. To mitigate concerns of anticompetitive conduct, structural separations have been employed in one case but not in others, and various types of non-structural separations have evolved. The Commission's concerns about anticompetitive behavior in ¶ 72 of the Notice have been raised with respect to LEC participation in each of these industries, but experience to date suggests that competition has been quite successful.

A. Vertical Anticompetitive Effects are Unlikely

If a LEC acquired a PCS license in its own territory, it would operate in both the wholesale (interconnection) and retail (PCS) parts of the business. While such a market structure offers the possibility that the LEC could use its market power in the wholesale market to advantage its interests in the retail market, economic analysis shows that a profit-seeking firm would have no incentive to do so. Moreover, a brief examination of the history of the paging and cellular markets shows that competitive, dynamic markets can evolve even when one competitor also supplies non-competitive interconnection services.

1. Incentives

Consider a LEC that participates in any of the mobile retail markets in question (paging, cellular, and PCS), and assume that market to be effectively competitive, as shown above. Assume for convenience that it is the only provider of the wholesale interconnection service. It is sometimes thought that the LEC would be able to increase its profits by effectively charging its downstream (retail) service a lower price for interconnection than it charged its retail competitors. Having lower costs in the retail market, the LEC could then underprice its competitors and increase its share of